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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,690	08/19/2003	Yoshiyuki Kurokawa	0553-0323.01	5081

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EXAMINER

WILSON, ALLAN R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/643,690

Applicant(s)

KUROKAWA ET AL.

Examiner

Allan R. Wilson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4,6,7,10-13,16-19,21,24-27,43,44 and 46-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,4,6,13,16-19,21,24-27,43,44 and 46-50 is/are allowed.
- 6) ☒ Claim(s) 7 and 10-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

Claim 43 is objected to because of the following informalities: Claim 43, line 13 should be amended to have --in-- inserted after "not". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by 5,215,934 to Tzeng. Tzeng teaches, with reference to figures 5 and 6, a memory transistor comprising:

an active layer 20, comprising a source 36, drain 37 and channel forming region (inherently formed between 36 and 37);

a first insulating film 30/31 formed on the active layer;

a floating gate 33 formed on the first insulating film;

a second insulating film (not shown, col. 6, lines 23-28); and

a control gate 35 formed on the second insulating film;

a first region 25a and a second region 25b formed in the channel forming region;

wherein a concentration of impurity elements in the first region is larger than a concentration of impurity elements in the second region (see the limitations of Tzeng, claim 26, citing that the threshold voltages differ between channel portions, and see col. 7, lines 2-6 teaching that the threshold difference is achieved by ion implantation), and wherein the impurity elements are any one of P-type impurity elements and N-type impurity elements (see col. 6, lines 4-8).

Regarding claim 10, this claim cites functional limitations which may be achieved by the structure of Tzeng; as taught by applicant, the function of storing multi-value information is achieved by applying different programming voltages, not by a difference in structure over that taught by Tzeng. Regarding claim 11, Tzeng teaches that the substrate 20 is single crystal silicon (col. 5, lines 39-41). Regarding claim 12, this claim merely cites intended uses of the structure anticipated by Tzeng and does not distinguish over Tzeng.

#### ***Allowable Subject Matter***

Claims 1, 4, 6, 13, 16-19, 21, 24-27, 43, 44, 46 and 47-50 are allowed.

#### ***Response to Arguments***

Applicant's arguments filed 05/16/2005 have been fully considered but they are not persuasive.

The argument that Tzeng fails to disclose or suggest "the impurity elements are any one of P-type impurity elements and N-type impurity elements" is not persuasive. Tzeng discloses in col. 6, lines 4-8, "[o]ther species are also effective in enhancing the thermal oxidation rate.

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Antimony, argon, arsenic, and boron, or any one of the group III-IV dopants, have proven effective for enhancing oxidation rates in silicon.” Therefore, Tzeng teaches impurity elements are one of P-type impurity elements or N-type impurity elements.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Note: The present case has been transferred to a different examiner.

Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is (571) 272-1738. Examiner Wilson can normally be reached 7:00-4:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allan R. Wilson  
Primary Examiner  
20 July 2005